Electronic TUBES

# 12R5

# PENTODE

## FOR TV VERTICAL-DEFLECTION AMPLIFIER APPLICATIONS

## DESCRIPTION AND RATING

The 12R5 is a miniature beam pentode primarily designed for use as a pentode-connected vertical-deflection amplifier in television receivers. The tube features high zero-bias plate current at relatively low plate and screen voltages. In addition, a controlled heater warm-up characteristic makes it especially suited for use in television receivers with series-connected heaters.

### GENERAL

**ELECTRICAL**

Cathode—Coated Unipotential

| | | |
|---|---|---|
| Heater Voltage, AC or DC | 12.6 | Volts |
| Heater Current | 0.6 | Amperes |
| Heater Warm-up Time* | 11 | Seconds |
| Direct Interelectrode Capacitances† | | |
| Grid-Number 1 to Plate | 0.55 | μμf |
| Input | 13 | μμf |
| Output | 9.0 | μμf |

**MECHANICAL**

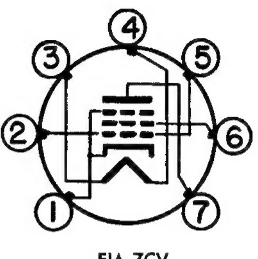
Mounting Position—Any
Envelope—T-5½, Glass
Base—E7-1, Miniature Button 7-Pin

### MAXIMUM RATINGS

**VERTICAL-DEFLECTION AMPLIFIER SERVICE‡**
**DESIGN-CENTER VALUES UNLESS OTHERWISE INDICATED**

| | | |
|---|---|---|
| DC Plate Voltage | 150 | Volts |
| Peak Pulse Plate Voltage | 1500§ | Volts |
| Screen Voltage | 150 | Volts |
| Peak Negative Grid-Number 1 Voltage | 150 | Volts |
| Plate Dissipation△ | 4.5 | Watts |
| Screen Dissipation | 1.0 | Watts |
| DC Cathode Current | 45 | Milliamperes |
| Peak Cathode Current | 155 | Milliamperes |
| Heater-Cathode Voltage | | |
| Heater Positive with Respect to Cathode | | |
| DC Component | 100 | Volts |
| Total DC and Peak | 200 | Volts |
| Heater Negative with Respect to Cathode | | |
| Total DC and Peak | 300 | Volts |
| Grid-Number 1 Circuit Resistance | | |
| With Cathode Bias | 2.2 | Megohms |

### BASING DIAGRAM

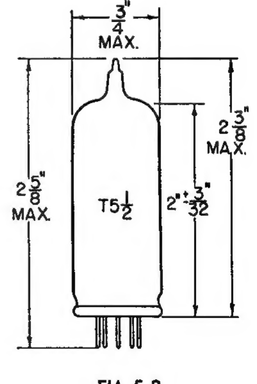



EIA 7CV

### TERMINAL CONNECTIONS

Pin 1—Cathode and Beam Plates
Pin 2—Grid Number 1
Pin 3—Heater
Pin 4—Heater
Pin 5—Grid Number 1
Pin 6—Grid Number 2 (Screen)
Pin 7—Plate

### PHYSICAL DIMENSIONS




EIA 5-3



## CHARACTERISTICS AND TYPICAL OPERATION

### AVERAGE CHARACTERISTICS

| | | | |
|---|---|---|---|
| Plate Voltage | 45 | 110 | Volts |
| Suppressor, Connected to Cathode at Socket | | | |
| Screen Voltage | 110 | 110 | Volts |
| Grid-Number 1 Voltage | 0¶ | −8.5 | Volts |
| Plate Resistance, approximate | | 13000 | Ohms |
| Transconductance | | 7000 | Micromhos |
| Plate Current | 120 | 40 | Milliamperes |
| Screen Current | 17 | 3.3 | Milliamperes |
| Grid-Number 1 Voltage, approximate | | | |
| Ib = 0.5 Milliamperes | | −22 | Volts |

* The time required for the voltage across the heater to reach 80 percent of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

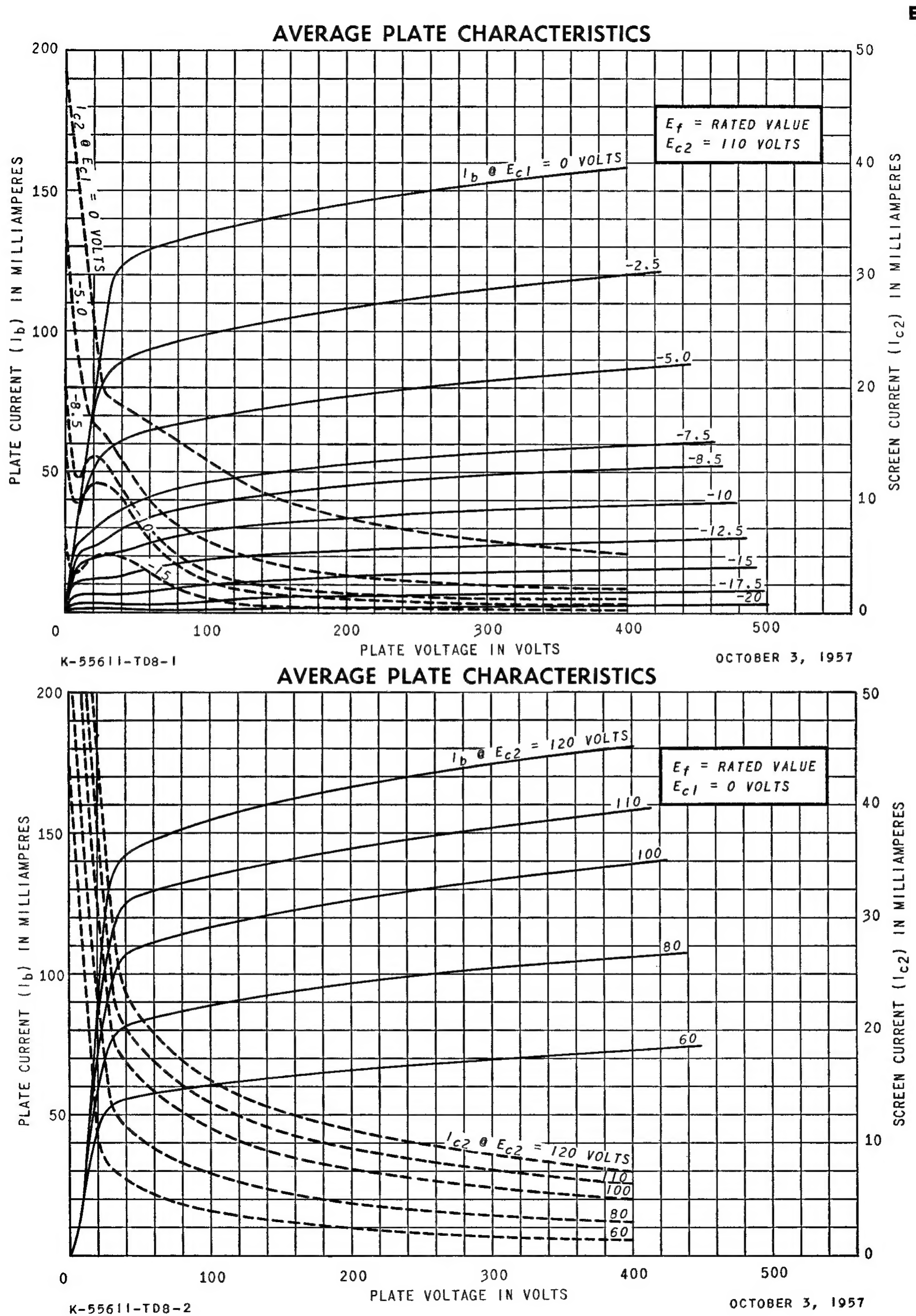
† Without external shield.

‡ For operation in 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

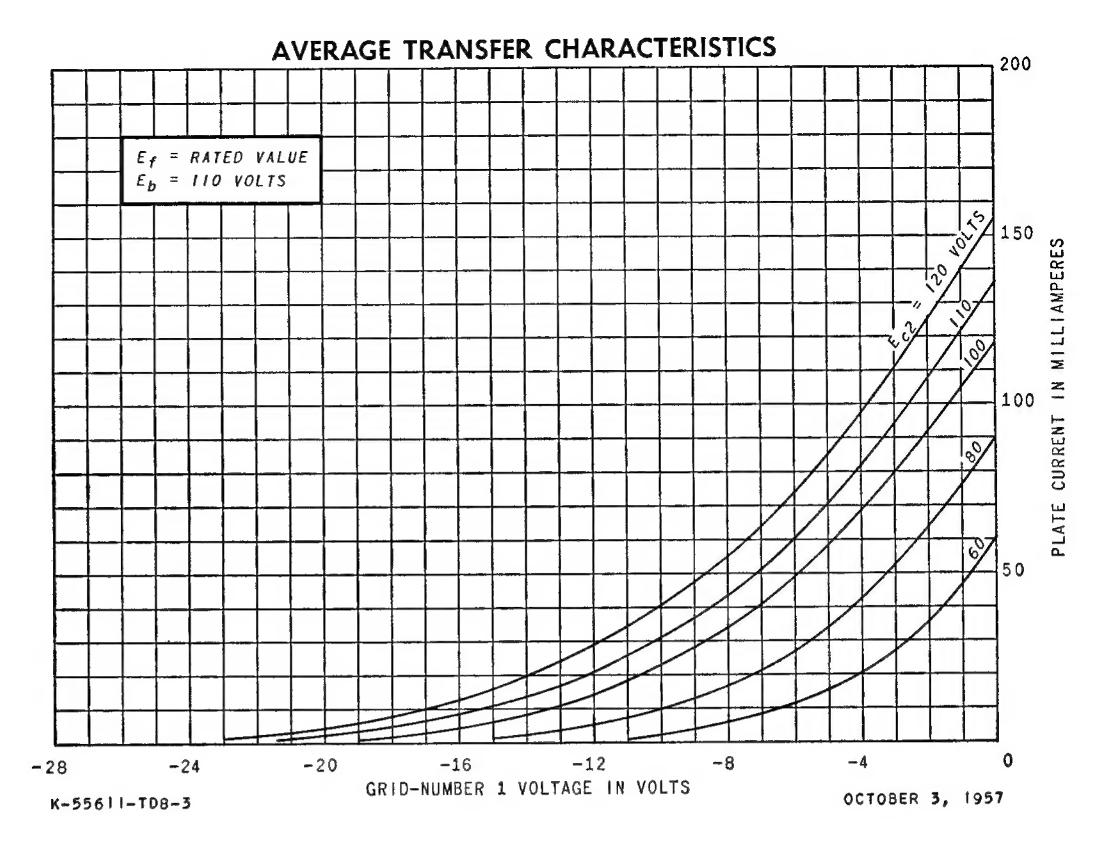
§ Value given is to be considered as an Absolute Maximum Rating. In this case, the combined effect of supply voltage variation, manufacturing variation including components in the equipment, and adjustment of equipment controls should not cause the rated value to be exceeded.

△In stages operating with grid-leak bias, an adequate cathode bias-resistor or other suitable means is required to protect the tube in the absence of excitation.

¶ Applied for short interval (2 seconds maximum) so as not to damage tube.


AVERAGE PLATE CHARACTERISTICS
Ef = RATED VALUE
Ec2 = 110 VOLTS
Ib @ Ec1 = 0 VOLTS
Ic2 @ Ec1 = 0 VOLTS
-2.5
-5.0
-7.5
-8.5
-10
-12.5
-15
-17.5
-20
PLATE CURRENT (Ib) IN MILLIAMPERES
SCREEN CURRENT (Ic2) IN MILLIAMPERES
PLATE VOLTAGE IN VOLTS
K-55611-TD8-1
OCTOBER 3, 1957
AVERAGE PLATE CHARACTERISTICS
Ef = RATED VALUE
Ec1 = 0 VOLTS
Ib @ Ec2 = 120 VOLTS
110
100
80
60
Ic2 @ Ec2 = 120 VOLTS
PLATE CURRENT (Ib) IN MILLIAMPERES
SCREEN CURRENT (Ic2) IN MILLIAMPERES
PLATE VOLTAGE IN VOLTS
K-55611-TD8-2
OCTOBER 3, 1957

## AVERAGE TRANSFER CHARACTERISTICS




## AVERAGE TRANSFER CHARACTERISTICS

